Rodrigo Quian Quiroga

Research Chair • Director of the Centre for Systems Neuroscience • Fellow Academy of Medical Sciences
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PERSONAL INFORMATION

- Date of birth: 21/03/1967
- Nationality: Argentinean, British.
- Marital Status: Married, 3 children.

EDUCATION

PhD in Applied Mathematics. University of Luebeck, Germany 1998
MSc in Physics. University of Buenos Aires, Argentina 1993

PROFESSIONAL HISTORY

Research Chair. Director - Centre for Systems Neuroscience. University of Leicester, UK 2012 -

Previous positions

Professor of Bioengineering. Head - Bioengineering research group. Univ. of Leicester, UK. 2008-2016
Reader in Bioengineering. Dept. of Engineering. University of Leicester, UK. 2006-2008
Lecturer in Bioengineering. Dept. of Engineering. University of Leicester, UK. 2004-2006
Sloan-Swartz Post-doctoral fellow. Center of Theoretical Neurobiology, Caltech, USA 2001-2004
Post-doc researcher. Research Center Juelich, Germany. 1998-2001
PhD student. Institute of Physiology, University of Luebeck, Germany. 1996-1998
Research assistant. Dept. Epilepsy. Inst. of Neurological Investigations FLENI, Argentina. 1995-1996
Research assistant. Dept. Neurophysiology. FLENI, Argentina 1993-1995

Visiting positions:

GuangCi Laureate visiting professor. Ruijin Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China. 2021 -
Visiting professor. Institut Hospital del Mar d'Investigacions Mèdiques (IMIM), Barcelona, Spain. 2019 - 2021
Visiting professor. Artififical Intelligence Research Centre, Peng Cheng Laboratories, Shenzhen, China. 2019 - 2021
Visiting professor. Barcelona Beta Brain Research Center, Barcelona, Spain. 2017 - 2019
Visiting professor. Department of Physics. University of Buenos Aires, Argentina. 2010 & 2016
Visiting professor. International School for Advanced Studies (SISSA), Trieste, Italy. 2011- 2014
Visiting professor. Concejo Nacional de Investigaciones Cientificas y Tecnicas, Argentina. 2013
Visiting researcher. Leibniz Institute of Neurobiology. University of Magdeburg, Germany 2006-2013
Visiting researcher. Department of Neurosurgery, UCLA, USA. 2004-2010
Visiting associate. Division of Biology, Caltech, USA. 2004-2007
Visiting scientist. Brain Science Institute, RIKEN, Japan. February-March 2001
Visiting scientist. University of Nijmegen, The Netherlands. March 2000

TEACHING

As a Research Chair I currently have no teaching duties.

Previous teaching:

Department of Engineering, University of Leicester 2004 – 2012
Design of discrete systems, Intr. to Biomedical Engineering, Digital signal processing, Circuits and systems.
Department of Physics, University of Buenos Aires, Argentina 1991 – 1996
Physics II (optic and thermodynamics), Physics I (mechanics, electromagnetism and hydrodynamic), Physics I (laboratory), Classical Mechanics.
Ciclo Basico Comun, University of Buenos Aires, Argentina 1989 – 1996
Physics (mechanics).

Advanced courses given:

- Memory and the hippocampus. SISSA, Trieste, Italy. 2011-2013.
- Systems Neuroscience. University of Buenos Aires, Argentina, 2010 and 2016.
- Processing of extracellular recordings: spike sorting. Second joint meeting of the Argentine Society for Neuroscience and the Argentine Workshop in Neuroscience. Cordoba, Argentina, 2010.

- Extracting information from neural populations. Second joint meeting of the Argentine Society for Neuroscience and the Argentine Workshop in Neuroscience. Cordoba, Argentina, 2010.
- Single-trial analysis of electroencephalographic signals. University of Madrid, Spain, 2006.
- Temporal and spatial analysis of electroencephalographic signals. University of Arizona, 2006; University of Reading; 2008 & University of Memphis, 2003.
- Nonlinear time series analysis. University of La Laguna, Spain, 2004.
- Introduction to Neuroscience. Young Engineering and Science Program, Caltech, USA, 2003.
- Physics applied to anesthesiology. Hospital Italiano, Argentina. 1994.

SUPERVISION OF STUDENTS

Post-doctoral researchers:

- Dr. Santiago Cordisco. 2021 –
- Dr. Francesca Rocchi. 2020 –
- Dr. Taylan Takan. 2018 – 2020.
- Dr. Adria Tauste. 2017 – 2020.
- Dr. Flavio Mourao. 2017 – 2018.
- Dr. Emanuele Schiavon. 2015 – 2017.
- Dr. Theofanis Panagiotaropoulos. 2015 – 2017.
- Dr. Harsimrat Singh. 2014 – 2015.
- Dr. Joaquin Navajas. 2014 – 2015.
- Dr. Maryam Ahmadi. 2013 – 2015.
- Dr. Natalia Grion. 2012 – 2014.
- Dr. Pinar Boyraz. 2012 – 2015.
- Dr. Manuel Molano. 2012 – 2014.
- Dr. Hernan Rey. 2010 – 2013. (from 2013 to 2020, lecturer at Centre for Systems Neuroscience).
- Dr. Luis Camuñas. 2010 – 2013.
- Dr. Carlos Pedreira. 2010 – 2014.
- Dr. Jonathan Becedas. 2009 - 2011
- Dr. Alberto Capurro. 2008 – 2010.
- Dr. Matias Ison. 2006 – 2007. (from 2007 to 2016, lecturer at Centre for Systems Neuroscience).
- Dr. Alexander Kraskov. 2004 – 2006.

PhD students:

- Lorenzo Gutierrez. 2020 –
- Marta Boscaglia. 2019 –
- Benjamin Netherwood. 2018 –
- Guadalupe Pascual (visiting student). 2018 – 2019.
- Manuel Franco Arias. 2015 – 2019.
- Emanuela de Falco. 2014 – 2017.
- Hugo Caffaratti. 2013 – 2017.
- Julieta Campi. 2011 – 2015.
- Vitor Lopes dos Santos (visiting student). 2012 – 2013.
- Joaquin Navajas. 2011 – 2014.
- Maryam Ahmadi. 2009 - 2013
- Zaira Pineda Rico. 2009 - 2013
- Jennifer Binnie. 2008 - 2012
- Juan Martinez-Gomez. 2006 – 2010.
- Carlos Pedreira. 2006 – 2010.
- Andreas Kaltenbruner (visiting student). Jan. 2006 – June 2006.

Directed >20 final year projects, MSc & MEng theses at the Dept. of Engineering, University of Leicester.

FUNDING

- £546,726. BBSRC (PI). Memory formation in the human medial temporal lobe. 2019-2023.
- £30,040. Royal Soc. (PI). Stability and plasticity of single neuron responses in the human hippocampus. 2018-19.
- £10,450. MRC (PI). A new generation of portable and digital acquisition systems for 24/7 human electrophysiology. 2017.
- USD 1,350,000. HFSP. (CI) (USD 300,000 for Leicester). Neuroscience of knowledge: Neural representation of concepts and their role in perception and memory. 2013-2017.

- £367,205. MRC (PI). "From single units to local field potentials: Study of the timing of medial temporal lobe responses in humans". 2011-2015.
- £321,028. EPSRC (PI). "Ultra Low Power Implantable Platform for Next Generation Neural Interfaces". 2010-14.
- £50,000. Royal Society (PI). "Wolfson research merit award". 2010-2015.
- £297,583. MRC (PI). "Intracraneal Recordings in humans". 2010-2013.
- £27,000. College of Science and Engineering. U. Leicester. 2011-2013.
- £779,102. BBSRC. (CI). "A systems approach to understanding sensory-motor control of aimed limb movements". 2010-2013.
- £30,338. AHRC (PI). "Visual perception in arts and neuroscience". 2011.
- £535,983. MRC. (PI) "Neural correlates of visual perception and behaviour: Analysis of multiple single-neuron recordings in humans". 2008-2011.
- £12,500. Leverhulme Trust. (PI). Artist in residence award. 2009-2010.
- £490,000. Capital Investment Fund, Univ. of Leicester (CI). Point of care implemented diagnostics unit. 2008.
- £12,000. (PI). Royal Society. "Study of learning processes with single-trial evoked potentials". 2008-2010.
- £51,992 (CI). AHRC. "Perception and wellbeing: a cross-disciplinary approach to experiencing art in the museum". 2008-2011.
- £13,839. EPSRC. (PI) "Data Reduction Techniques for Systematic Information Quantification in Large Scale, Multiple Spike Trains". 2007-2008.
- £125,567. EPSRC. (PI) "Neural coding of visual inputs in the human medial temporal lobe". 2006-2009.
- £4,037,770. EPSRC. (CI) (£102,000 for Leicester) "Code analysis, repository, and modeling for e-Neuroscience". 2006-2011.
- $110,000. Swartz Foundation. "Coding and decoding of visual perception from multiunit activity and local field potentials" with Christof Koch. 2004-2006.

PATENTS

- System for a Brain-Computer-Interface. International patent (2015 - PCT/GB2015/050217) approved in EU, USA, China and Japan. Inventors: Jackson A, Constandinou T, Eftekhar A, Quian Quiroga R and Navajas J.

SELECTED PRESS COVERAGE

My research has received large media attention worldwide, having featured in the New York Times, the Wall Street Journal, Scientific American, Daily Mail, New Scientist, The Independent, among many others. Below is a selected list of press releases. For a full list see: http://www2.le.ac.uk/centres/csn/news-and-events-2

- Article in Nature Communications (2016) about the memory web in the human brain has been featured in several press releases, including Nature, New Scientist, Science Daily, La Nacion, La Vanguardia, etc.
- Article in Neuron (2015) about rapid memory formation featured in several press releases, including The New York Times, Daily Mail, BBC News, Reuters and Science, among many others.
- Research at the CSN featured in New Scientist (November 2015).
- The work at my Centre was featured in the British Neuroscience Association Bulletin. (2014)
- Article in Neuron (2014) about face perception featured in several press releases, including Scientific American Mind, The Daily Mail and Munich Eye.
- Article in Current Biology (2014) about the timing for memory formation featured in several press releases.
- Article on concept cells featured in the cover of Scientific American, 2013.
- Research on visual perception of art was featured in a Channel 4 documentary ("What makes a masterpiece"), where we performed studies of how people look at art both in the laboratory and at Tate Britain. (2012)
- The Art & Science exhibition I organized at the Embrace Art Centre was featured in several newspapers, art magazines and in The Lancet Neurology. (2012)
- My research profile was featured in Current Biology. (2011)
- My book 'Borges and memory' attracted large media attention, including several TV, radio, magazine and newspaper interviews. It was reviewed in Nature, Times Higher Magazine, Leonardo and The British Society for Literature and Science, among others. (2011).
- My research with human single cell recordings was described in a feature news article in Nature ("Opening up brain surgery"). (2009).
- Article in Current Biology 2009 featured in more than 50 press releases including: The Wall Street Journal, The Washington Post, New Scientist, Discover Magazine, ABC News, USA Today, etc.
- Professorial Inaugural Lecture featured in Daily Mail, Daily Telegraph, BBC World, and others. (2008).
- Article in PNAS 2008 featured in Research Highlights from Nature Reviews Neuroscience, La Recherche, United Press International, etc.
- Article in J. Neurophysiology 2007 featured in Critica de Argentina, Leicester Mercury, Perfil, Illustreret Videnskab (Scandinavian scientific magazine).

- Article in Nature 2005 selected as one of the top 100 scientific stories of the year by Discover Magazine and featured in The New York Times, Scientific American, Nature Reviews Neuroscience, New Scientist, LA Times, Daily Mail, The Independent, etc.

AWARDS AND HONORS

- Distinguished Scientist, President's International Fellowship, Chinese Academy of Sciences, 2019.
- Fellow of the Academy of Medical Sciences, since 2019.
- Selected as one of the 10 UK leaders in Science and Engineering by the Engineering and Physical Sciences Research Council and the Royal Academy of Engineering 2015.
- Selected among the top 100 Argentinean innovators (by BGH), 2013.
- Appointed as one of the 5 Research Chairs at the University of Leicester. 2012.
- Royal Society Wolfson Research Merit Award. 2010.
- Work on neural correlates of conscious perception selected as one of the "Breaking news in Neuroscience" by the federation of European Neuroscience Societies (fENS), 2008.
- Work on invariant representation by single neurons selected as one of the top 100 scientific stories of 2005 by Discover Magazine.
- Achievement award, University of Leicester, 2005.
- Best poster price at the meeting: "Neural substrates of cognition." Madrid, 2005.
- Sloan-Swartz fellow, 2001-2003.
- Young investigator award given by the American Epilepsy Society, 2001.
- Prize to the scientific-technological production. Univ. of Buenos Aires, 1995.

REFEREE FOR JOURNALS

Science, Nature, Cell, Nature Reviews Neuroscience, Nature Neuroscience, Neuron, Journal of Neuroscience, Current Biology, PNAS, NeuroImage, Psychological Reviews, Trends in Neuroscience, PLOS Biology, PLOS Computational Biology, Neural Computation, Neuropsychologia, Physical Review Letters, Physical Review E, Physica D, Physics Letters A, Chaos and Complexity Letters, IEEE Signal Processing Letters, IEEE Transactions on Biomedical Engineering, Journal of Neuroscience Methods, Cerebral Cortex, Clinical Neurophysiology, Journal of Computational and Applied Mathematics, Biological Psychology.

EXTERNAL REFEREE / PANEL MEMBER FOR:

- Member of Academy of Medical Sciences selection committee. 2020 -
- Royal Society Neural Interface technologies Steering Group. 2018
- Editorial Board of the book collection "El Aleph". 2017 -
- Panel member Science Foundation Ireland Career Development Awards / Starting Investigator Grants. 2016.
- Biotechnology and Biological Sciences Research Council (BBSRC). Rotating panel member. 2009-2014.
- Medical Research Council (MRC) Biomedical Informatics Panel member. 2008-2011.
- Engineering and Physical Sciences Research Council (EPSRC). Member of the Review College.
- European Commission FP7 & Horizons 2020 Programs.
- Netherlands Organization for Scientific Research.
- French National Research Agency.
- University of Toulouse, France.
- Cornell University, USA.
- University of Buenos Aires.
- Cyprus University of Technology.
- Trinity College Dublin.
- Sandia National Laboratories, USA.
- Swiss National Science Foundation.
- Indian Institute of Technology, Bombai, India.
- Universidad Complutense de Madrid.
- Universidad Pompeu-Fabra, Barcelona, Spain.
- King's College London.
- University of Leuven, Belgium.
- University of Nijmegen, The Netherlands.

INVITED PRESENTATIONS

More than 100 plenary talks and invited lectures at conferences and academic institutions in the last 10 years.

Rodrigo Quian Quiroga

EVENTS ORGANIZED

- FENS-Hertie Winter School on "Memory mechanisms in humans". Obergurgl, Austria; 2016.
- Neuroscience and Behavior Day. University of Leicester, 2015.
- The Art of Visual Perception. Art & Science exhibition. Embrace Arts Centre, Leicester, 2012.
- The Neuroscience of Magic minisymposium. University of Leicester, 2012.
- Neurolunch seminar series. University of Leicester, 2008 – 2009.
- Computational Brain (co-organizer). University of Leicester, 2009.
- Neural coding in different sensory modalities (with Dr. Tim Pearce). University of Leicester, 2005.

PUBLICATION SUMMARY

- 5 Books and more than 120 Research Articles.
- H-index: 60 >17,000 citations [Source: Google Scholar]

PUBLICATION LIST

I – Books

1. **Neuroscience Fiction** (in Spanish, English & Korean)
   Rodrigo Quian Quiroga
   Sudamericana 2018; BenBella 2020 & Hyungju Press 2022.

2. **The forgetting machine** (in Spanish, English, Chinese & Korean)
   Rodrigo Quian Quiroga
   Paidos 2015; BenBella 2017, Electronics Industry 2020 & Hyungju Press 2022.

3. **Imaging brain function with EEG: Advanced temporal and spatial analysis of electroencephalographic signals.**
   Walter Freeman and Rodrigo Quian Quiroga
   Springer, 2013.

4. **Principles of neural coding.**
   Rodrigo Quian Quiroga and Stefano Panzeri.
   CRC Taylor and Francis, 2013.

5. **Borges and memory.** (in English, Spanish, Turkish and Italian)
   Rodrigo Quian Quiroga
   MIT Press 2012; Sudamericana 2011; Bogazici Universitesi Yayinevi 2017 & Erickson 2018.

II- Journal articles

1. **When shared concept cells support association: theory of overlapping memory engrams.**
   Gastaldi C, Schwalger T, De Falco E, Quian Quiroga R and Gerstner W.
   PLOS Computational Biology 17: e1009691; 2021.

2. **Still challenging the pattern separation dogma: 'quiero retruco'.**
   Quian Quiroga R.
   Trends in Cognitive Sciences 25: 923-924; 2021.

3. **A simple metric to study the mechanisms generating event-related potentials.**
   Ahmadi M, Schoenfeld A, Hillyard S and Quian Quiroga R.
   Journal of Neuroscience Methods 109230; 2021.

4. **How are memories stored in the human hippocampus?**
   Quian Quiroga R.
   Trends in Cognitive Sciences 25: 425-426; 2021.

5. **No pattern separation in the human hippocampus.**
   Quian Quiroga R.
   Trends in Cognitive Sciences 24: 994-1007; 2020.

6. **Closing the gap between mind and brain with the dynamic connectome.**
   Quian Quiroga R.
   Proc. Natl. Acad. Sci. USA 117: 9677-9678; 2020.

7. **Searching for the neural correlates of human intelligence.**
   Quian Quiroga R.
   Current Biology 30: R335-338; 2020.

8. **Single neuron coding of identity in the hippocampal formation.**
   Rey H, Gori B, Chaure R, Collavini S, Blenkmann A, Seoane P, Seoane E, Kochen S and Quian Quiroga R.
   Current Biology 30: 1-8; 2020.

9. **Plugging in to human memory: Advantages, challenges and insights from human single neuron recordings.**
   Quian Quiroga R.
   Cell 179: 1015-1032; 2019.

10. **Neural representations across species.**
    Quian Quiroga R.
    Science 363: 1388-1389; 2019.

11. **Akakhievitch revisited.**
    Quian Quiroga R.
    Physics of Life Reviews 29: 111-114; 2019.

12. **A neural hallmark of auditory implicit learning is altered in older adults.**
    Donohue S, Weinhold S, Schoenfeld M, Quian Quiroga R and Hopf J-M.
    PLOS ONE 14: e0211468, 2019.

13. **Encoding of long-term associations through 'neural unitization' in the human medial temporal lobe.**
    Rey H, De Falco E, Ison M, Valentin A, Alarcon G, Selway R, Richardson M and Quian Quiroga R.
    Nature Communications 9: 4372, 2018**.**

14. **A novel and fully automatic spike sorting implementation with variable number of features.**
    Chaure R, Rey H and Quian Quiroga R.
    Journal Neurophysiology 120: 1859-1871, 2018.

15. **Compact Standalone Platform for Neural Recording with Real-Time Spike Sorting and Data Logging.**
    Luan S, Williams I, Maslik M, Liu Y, De Carvalho F, Jackson A, Quian Quiroga R and Constandinou T.
    Journal of Neural Engineering 15: 046014, 2018.

16. **Extracting information from the shape and spatial distribution of evoked potentials**.
    Lopes-dos-Santos V, Rey H, Navajas J, Quian Quiroga R.
    J**ournal of Neuroscience Methods,** 296 12–22; 2018.

17. **How do we recognize a face?**
    Quian Quiroga R.
    Cell 169: 975–977; 2017.

18. **Dissociation between the neural correlates of conscious face perception and visual attention.**
    Navajas J, Nitka A and Quian Quiroga R.
    Psychophysiology 54: 1138-1150; 2017.

19. **Persistent single neuron activity during working memory in the human medial temporal lobe.**
    Kornblith S, Quian Quiroga R, Koch C, Fried I and Mormann F.
    Current Biology 27:1026-1032; 2017.

20. **Scene selective coding by single neurons in the human parahippocampal cortex.**
    Mormann F, Kornblith S, Cerf M, Ison M, Kraskov A, Tran M, Knieling S, Quian Quiroga R, Koch C and Fried I.
    Proc. Natl. Acad. Sci. USA 114: 1153-1158; 2017.

21. **Long-term coding of personal and universal associations underlying the memory web in the human brain.**
De Falco E, Ison M, Fried I and Quian Quiroga R.
Nature Communications 7:13408, 2016.

22. **Improving data quality in neuronal population recordings.**
Harris K, Quian Quiroga R, Freeman J and Smith S.
Nature Neuroscience 19: 1165-1174, 2016.

23. **Where is the ball?**
Behavioral and neural responses elicited by a magic trick.
Harris K, Quian Quiroga R, Freeman J and Smith S.
Psychophysiology 53(9): 1441-8, 2016.

24. **Magic and Cognitive Neuroscience.**
Rodrigo Quian Quiroga.
Current Biology 26: R387–R407, 2016.

25. **The visual development of hand-centered receptive fields in a neural network model of the primate visual system trained with experimentally recorded human gaze changes.**
Galeazzi J, Navajas J, Mender B, Quian Quiroga R, Minini L and Stringer S.
Network: Computation in Neural Systems 27(1): 29-51, 2016.

26. **Neuronal codes for visual perception and memory.**
Rodrigo Quian Quiroga
Neuropsychologia 83: 227-241, 2016**.**

27. **Rapid encoding of new memories by individual neurons in the human brain.**
Ison M, Quian Quiroga R* and Fried I* (* co-senior authors).
Neuron 87, 220-230, 2015.

28. **Past, present and future of spike sorting techniques.**
Rey H, Pedreira C and Quian Quiroga R.
Brain Research Bulletin 119: 106-117, 2015.

29. **Neuronal encoding of memory in the human and mouse hippocampus.**
Campi J and Quian Quiroga R.
European Journal of Neurodegenerative Diseases 3: 91-99, 2015.

30. **Bayes Optimal Template Matching for Spike Sorting – Combining Fisher Discriminant Analysis with Optimal Filtering.**
Franke F, Quian Quiroga R, Hierlemann A and Obermayer K.
Journal of Computational Neuroscience 38: 439-459, 2015.

31. **Single cell recordings in the human medial temporal lobe.**
Rey H, Ison M, Pedreira C, Valentin A, Alarcon G, Selway R, Richardson M, Quian Quiroga, R.
Journal of Anatomy 227: 394-408, 2015.

32. **Extracting information in spike time patterns with wavelets and information Theory.**
Lopes-dos-Santos V, Panzeri S, Kayser C, Diamond M, Quian Quiroga R**.**
Journal of Neurophysiology 113:1015-1033, 2015.

33. **Single trial analysis of field potentials in perception, learning and memory**.
Rey H, Ahmadi M and Quian Quiroga R.
Current Opinion in Neurobiology, 31: 148-155, 2015.

34. **Single-cell responses to face adaptation in the medial temporal lobe.**
Quian Quiroga R, Kraskov A, Mormann F, Fried I and Koch C.

Neuron, 84: 363-369, 2014.

35. **Timing of single neuron and local field potential responses in the human medial temporal lobe.**
Rey H, Fried I and Quian Quiroga R.
Current Biology, 24: 299-304. 2014.

36. **Looking for a face in the crowd: fixation-related potentials in an eye-movement visual search task.**
Kaunitz L, Kamienkowski J, Varatharajah A, Sigman M, Quian Quiroga R and Ison M.
Neuroimage, 89: 297–305, 2014.

37. **Real Time Decoding for Brain Machine Interface Applications.**
Becedas J and Quian Quiroga R.
Journal of Bioinformatics and Biological Engineering, 2: 20-32, 2014.

38. **Minimum Requirements for Accurate and Efficient Real-Time On-Chip Spike Sorting.**
Navajas J, Barsakcioglu D, Eftekhar A, Jackson A, Constandinou T and Quian Quiroga R.
Journal of Neuroscience Methods, 230: 51-64, 2014.

39. **Classification of EEG abnormalities in partial epilepsy with simultaneous EEG-fMRI recordings.**
Pedreira C, Vaudano A, Thornton R, Chaudhary U, Vulliemoz S, Laufs H, Rodionov R, Carmichael D, Lhatoo S, Guye M, Quian Quiroga R and Lemieux L.
Neuroimage 12; 99: 461-476, 2014.

40. **An Analogue Front-End Model for Developing Neural Spike Sorting Systems.**
Barsakcioglu D, Liu Y, Bhunjun P, Navajas J, Eftekhar A, Jackson A, Quian Quiroga R and Constandinou T.
IEEE Transactions on Biomedical Circuits and Systems, 8: 216-27, 2014.

41. **Perceptual and contextual awareness: Methodological considerations in the search for the neural correlates of consciousness.**
Navajas J, Rey H and Quian Quiroga R.
Frontiers in Psychology, 5: 959, 2014.

42. **Gnostic cells in the XXI century.**
Quian Quiroga R.
Acta Neurobiologiae Experimentalis 73: 1-9; 2013.

43. **Meaning from sensory information.**
Quian Quiroga R.
Physics of Life Reviews 10: 101-102; 2013.

44. **Brain cells for grandmother.**
Quian Quiroga R, Fried I and Koch C.
Scientific American 308 (2): 30-35; 2013.

45. **A detailed and fast model of extracellular recordings.**
Camunas-Mesa L and Quian Quiroga R**.**
Neural Computation 25, 1191–1212, 2013.

46. **Uncovering the Mechanisms of Conscious Face Perception: A Single-Trial Study of the N170 Responses.**
Navajas J, Ahmadi M and Quian Quiroga R**.**
Journal of Neuroscience 33(4): 1337-1343, 2013.

47. **Automatic denoising of single-trial evoked potentials.**
Ahmadi M and Quian Quiroga R**.**
NeuroImage 66: 672-680; 2013.

48. **Neural Correlates of Learning and Trajectory Planning in the Posterior Parietal Cortex.**
Torres E, Quian Quiroga R, Cui H and Buneo C.
Frontiers in Integrative Neuroscience 7:39, 2013.

49. **The learning oddball paradigm: data of 24 separate individuals illustrate the possibility of a new clinical tool.**
Marijtje L.A. Jongsma, Niels J.H.M. Gerrits, Tom Eichele, Roald Maes, Bert Steenbergen, Clementina M. van Rijn, and Rodrigo Quian Quiroga.
Clinical Neurophysiology 124(3):514-521, 2013.

50. **How many neurons can we see with current spike sorting algorithms?**
Pedreira C, Martinez J, Ison MJ and Quian Quiroga R
Journal of Neuroscience Methods 211: 58-65; 2012.

51. **Concept cells: The building blocks of declarative memory functions.**
Quian Quiroga R
Nature Reviews Neuroscience 13: 587-597; 2012.

52. **Fixation-related potentials in visual search: a combined EEG and eye tracking study.**
Kamienkowski J.E., Ison M.J., Quian Quiroga R. and Sigman M.
Journal of Vision 12: 1–20; 2012.

53. **In vivo neuronal firing patterns during human epileptiform discharges replicated by electrical stimulation.**
Alarcon G, Martinez J, Kerai S, Lacruz M, Quian Quiroga R, Selway R, Richardson M, Garcia Seoane J and Valentin A.
Clin Neurophysiol 123:1736-1744; 2012.

54. **Spike sorting**
Quian Quiroga R
Current Biology 22: R45–R46, 2012.

55. **Event related potentials to digit learning: Tracking neurophysiologic changes accompanying recall performance**
Marijtje L.A. Jongsma, Niels J.H.M. Gerrits, Clementina M. van Rijn, Rodrigo Quian Quiroga, Joseph H.R. Maes
Int. J. Psychophysiol. 85: 41-48; 2011.

56. **Selectivity of pyramidal cells and interneurons in the human medial temporal lobe**
Ison M. J., Mormann F., Cerf M., Koch C., Fried I., Quian Quiroga R.
J Neurophysiol 106:1713-1721, 2011

57. **A category-specific response to animals in the right human amygdala**
Mormann F., Dubois J., Kornblith S., Milosavljevic M., Cerf M., Ison M., Tsuchiya M., Kraskov A., Quian Quiroga R., Adolphs R., Fried I., Koch C.
Nature Neuroscience 14: 1247–1249; 2011.

58. **Looking at Ophelia: A comparison of viewing art in the gallery and in the lab.**
Binnie J, Dudley S, Quian Quiroga R.
Advances in Clinical Neuroscience and Rehabilitation. Vol 11. Number 3: 15-18, 2011.

59. **How do we see art: an eye-tracker study.**
Rodrigo Quian Quiroga, Carlos Pedreira
Frontiers in Human Neuroscience 5:98, 2011.

60. **Signal processing for neural spike trains.**
Berger T, Chen Z, Cichocki A, Oweiss K, Quian Quiroga R, Thakor N.
Computational Intelligence and Neuroscience. Vol 2010 art: 698751; 2010.

61. **On-Line, Voluntary Control of Single Neurons by Human Though**
Cerf M, Thiruvengadam N, Mormann F, Kraskov A, Quian Quiorga R, Koch C and Fried I.
Nature 467: 1104-1108; 2010.

62. **In retrospect: Funes the Memorious**
Quian Quiroga R
Nature 463: 611; 2010

63. **Responses of human medial temporal lobe neurons are modulated by stimulus repetition**
Pedreira C, Mormann F, Kraskov A, Cerf M, Fried I, Koch C and Quian Quiroga R.
Journal of Neurophysiology 103: 97-107; 2010.

64. **Measuring sparseness in the brain: comment on Bowers (2009).**
Quian Quiroga R and Kreiman G
Psychological Reviews 117: 291-297; 2010.

65. **Postscript: About Grandmother cells and Jennifer Aniston neurons**
Quian Quiroga R and Kreiman G
Psychological Reviews 117: 297-299; 2010.

66. **Explicit encoding of multimodal percepts by single neurons in the human brain**
Quian Quiroga R, Kraskov A, Koch C, Fried I
Current Biology. 19: 1308-1313; 2009

67. **Human medial temporal lobe neurons respond preferentially to personally-relevant images.**
Viskontas I*, Quian Quiroga R* and Fried I (* equal contribution)
Proc. Natl. Acad. Sci. USA 106: 21329-21334; 2009.

68. **Realistic simulations of extracellular recordings**
Martinez J, Pedreira C, Ison M and Quian Quiroga R
Journal of Neuroscience Methods 184: 285-293; 2009

69. **Extracting information from neural populations: Information theory and decoding approaches.**
Quian Quiroga R. and Panzeri S.
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